Analyzing influential factors determining cropland lease contract choice between cash rent and cropshare

by

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Abstract

Cropland tenants and landowners must agree on a type of contract when entering a lease. Historically, the two most popular types of contracts are cash rent and cropshare. What variables cause tenants and landowners to choose one type of contract over the other? Is it simply a random decision? Or are there tangible, identifiable, quantifiable factors that play a role?

This thesis attempts to determine the most influential factors that affect contract choice. This is accomplished using a binomial logistic regression model with data from surveys distributed to nearly two thousand tenants in the Kansas Farm Management Association database and their landlords. While there were a few noticeable trends in the data, all tenant-landowner relationships and situations are unique. Because of this, individual factors cannot be said to be definitive predictors for a particular choice of contract.

Results showed that the most influential factors for a tenant were whether or not the leased land was being used to grow hay crops, whether or not the leased land was irrigated, and the tenant's annual household income. For landowners, the most notable factors of contract choice were found to be the number of tenants a landowner worked with, whether or not the tenant was family, the risk preference of the landowner, and the age of the landowner.

These variables either fall into the category of transaction cost theory or risk sharing. Arguments have been made for both theories, and the results of this study lead to the conclusion that both transaction cost and risk sharing are viable theories with a noticeable impact on contract choice.

Table of Contents

List of Figures

List of Tables

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Chapter 1 – Introduction

There are many theories that have been discussed as to why either cash rent or cropshare contracts are chosen over the other in agricultural land leasing. Many different factors and perspectives must be considered. Unfortunately, it is difficult to investigate and there is little empirical research to back up these theories, due in part to the private nature of the parties in the lease contract. In addition, some of the studies that have been done are either not conducted in the United States or are becoming outdated.

Cash rent is a type of contract where the tenant, or farmer, pays the landowner a fixed amount per acre and, in return, gets to keep the entire crop after harvest. Typically, the tenant is responsible for all input costs in a cash rent contract. In a cropshare contract, however, the tenant and landowner typically split the costs of inputs and, as the name suggests, share the crop. The harvested product is divided between the farmer and the landlord, so each get revenue by selling their portion of the total crop harvested. The specifics of cropshare contracts tend to differ for virtually every tenant and landowner.

Each type of contract provides different incentives that may change the way a tenant farms the land or how the landowner manages the land. In a cash rent contract, the tenant receives all of the revenue from the harvested product, meaning the tenant would want to produce as much as possible. The farmer has the ability to take advantage of the landowner by overusing the key input the landowner has provided, the land. Continuous planting of a more profitable crop as opposed to proper crop rotation, using an extreme amount of chemicals and fertilizer that damage the soil quality, and using tillage practices that show immediate benefits but reduce long-term soil moisture are all ways that the farmer can try to increase short-term profits by increasing immediate crop production. If a fallow season is needed to preserve soil

moisture or prevent erosion, a cash rent tenant is less likely to cooperate, as there is no immediate monetary benefit for the farmer without producing a crop. The landowner will not see any increase or decrease in immediate profit, as the tenant is paying a fixed amount, but the land's value may decrease due to the abuse. However, landowners can mitigate this risk by building relationships and leasing long-term to tenants so the farmer will benefit from caring for the land in the long run. If these negative practices are occurring, the landowner's asset, the soil, will be damaged long-term. If the land is expected to be used for other purposes, such as urban development if near a city, the long-term negative effects of this practice will make less of an impact.

However, with cropshare, the tenant must share the profits of the crop, so maximizing immediate success is less beneficial. The tenant would see less of an increase in income as they would only receive a portion of the product. The extra effort to maximize production is not as rewarding. Because of this, the farmer is less likely to exploit the landowner's inputs. Land that is more sensitive to tillage when it comes to soil moisture or structure will likely result in cropshare contracts to reduce the likelihood of the farmer to consciously degrade the soil. Additionally, crops that typically require more tillage, such as row crops, as opposed to hay crops, are subject to more misuse by the farmer, resulting in cropshare as the assumed preferred contract by the landowner. In the event of extreme weather, a farmer will be more likely to tend to a crop that they own outright before a crop they must share. Another problem with cropshare contracts is underreporting. A farmer could potentially keep the highest quality grain while giving the landowner the lower quality, or the farmer could report a lower yield to the landowner and keep the surplus grain if the total production is not easily verifiable or quantifiable by the landowner. There may be costs associated with measuring and dividing the grain. Crops sold

publicly, such as grain at an elevator, are easier to monitor and measure than crops sold privately, such as bales of hay. On-farm storage is one way farmers may be able to get around the transparency and accuracy of public elevators, although it can be costly. The effect of these costs should be considered when deciding between cash rent and cropshare contracts. Unfortunately, these effects are difficult to quantify and measure.

These costs can be considered incentives. For cash rent, the farmer has an incentive to overuse the inputs provided by the landowner in attempt to exploit the soil for immediate returns. In cropshare, the farmers are incentivized to underreport or to take better care of their own crops first. A flex lease is a third type of contract that is essentially a combination of a cash rent and a cropshare contract. These types of contracts are so rarely used that they were not analyzed in this study.

An important implication to consider is that, in general, as crop division costs increase, the contract that will maximize value to both farmers and landowners changes from cropshare to cash rent. On the other hand, because land inputs are more overused in cash rent scenarios, as land attributes' costs increase, the maximum value will shift from cash rent to cropshare. In other words, if land increases in value, a landowner will be more likely to prefer cropshare so that the farmer does not overuse and abuse the soil. The landowner and tenant must try to balance crop division costs and land attributes' costs when determining which type of contract to use (Allen & Lueck, 1992).

Another way that tenants and landowners form opinions on contract type is their risk preference. For tenants, the more risky contract is cash rent. In a cash rent contract, the tenant has no protection for a bad crop year and must pay the same rent regardless of yield or market prices. There are some cases where a cash rent lease may be adjusted based on yield or market

prices, but this does not appear to be common practice. For landowners, the more risky contract is cropshare. In a cropshare contract, there is more variance in landowner income, as the lease payment depends on the success of the crop. Landowners are guaranteed an agreed upon amount of income in a cash rent contract. In a situation where a tenant can afford to take on more risk and their landowner prefers little risk exposure, a cash rent contract may be more likely. Clearly, if both the tenant and landowner are risk averse, there is no obvious choice. Other factors must be considered to determine the appropriate contract type.

This study attempts to determine the most influential characteristics of contract choice. A survey was sent out to tenants and landowners from the Kansas Farm Management Association database. Surveys were bundled with both the tenant and landowner surveys in one package and sent to every farmer in the database. The farmers were instructed to deliver the landowner survey to the landlord of their largest cropland lease. A total of 3,970 surveys were distributed, with a response rate of about 23 percent (26 percent of tenants and 20 percent of landowners). The surveys, seen in the Appendix, covered a broad range of information, and were primarily aimed at tenant-landowner relationships and gaining perspectives and opinions on aspects of government conservation programs. For this study, questions from the surveys were identified that would provide relevant information pertaining to contract choice between cropshare and cash rent. One particular question, which is the basis of this study, asked which type of contract tenants and landowners use for their largest lease.

While the results are difficult to interpret, it is clear that both transaction cost theory and risk-sharing incentives are supported by this study. Both are important factors to consider when deciding on contract choice. Data from the tenant survey showed slightly more logical and conclusive results. This may be considered evidence that tenants actually have more decision

making power than landowners. Typically, tenants tend to think that landowners actually hold the power when making decisions on lease agreements.

Chapter 2 – Literature Review

2.1 Contract Choice: Transaction Cost Theory

One study in particular that stands out as being thoughtful, relevant and thorough was done by Douglas Allen and Dean Lueck, titled '*Contract Choice in Modern Agriculture: Cash Rent versus Cropshare'*. Allen and Lueck used data from Nebraska and South Dakota farms to build a model that interprets the incentives of each type of contract, in effort to determine how producers and landowners choose between cash rent and cropshare contracts.

In other words, what factors motivate, incentivize and ultimately determine how landowners and producers agree upon each type of contract? The answer to this question can help farmers and landowners make more educated and informed choices in the future by analyzing specific factors of their own operations to maximize the potential return on their investment, whether it be a landowner investing in acreage, or a tenant investing in the crop of the current or upcoming years. The study was built on two stages. First, identifying the various choices available to a farmer, followed by determining the best contract type for the situation.

It is important to note that their study assumed that all parties involved in the process were risk neutral. Ignoring risk sharing, Allen and Lueck based their study on transaction cost theory. They analyzed the key costs associated with each type of contract. This helped determine the important incentives that each contract provides. Multiple scenarios were identified that highlight the costs and reasoning for the contract type that is most suitable to each situation.

Logistic-regression was used to analyze the effects of these factors. The dependent variable showed 'one' if the contract chosen was cropshare and 'zero' if the contract chosen was cash rent. The variables selected for the regression include whether or not irrigation was used, whether or not the landowner was an institution, whether or not hay crops were exclusively

grown, whether or not row crops were exclusively grown, whether hay crops and row crops were both grown, population density, urbanization, number of acres, whether or not tenant and landowner were family, farm income, age, and whether or not the landowner was absent from the farm.

Hay, irrigation, row crop and population density resulted in the expected signs, were statistically significant, and significantly affected the contract decision. As discussed before, hay requires little tillage and is more difficult to measure and monitor. Irrigated land protects soil from moisture exploitation, minimizing the negative effects of cash rent contracts. High population density decreases the long-term negative effect of soil abuse. These variables verified the expectation that cash rent contracts were more likely. Row crops require increased tillage, exposing the land to increased exploitation and abuse, which resulted in higher likelihood of cropshare contracts being chosen.

Coefficients of some other variables were also correctly predicted, but lacked sufficient t-statistics. Number of acres and farming of both hay and row crops resulted in coefficients not significantly different from zero. While insignificant, the expectation of cash rent being the preferred contract for institutions due to increased output-division costs was supported by the coefficient. Age and absent landowner's coefficients were also insignificant. The model assumed that landowners only provide land and no other inputs or decisions.

Although the model assumed risk-neutrality, Allen and Lueck discussed the implications of considering risk preferences in determining contract choice. Cropshare contracts are assumed to be less risky for tenants, as there is less variance in income. Cropshare risk would be further reduced if revenue was shared as opposed to crops. Allen and Lueck claim that because landowners are typically farmers themselves, tenants and landowners share similar traits and

should share similar risk preferences. Because of this, farmers and landowners should have complete opposite incentives for each factor of contract choice. Farm income was a variable used to determine risk preference. As farm income becomes a larger share of their total income, producers should be more risk averse. Reducing risk goes back to the idea that farmers reduce risk by reducing income variance by choosing cropshare contracts and that landowners reduce risk by reducing income variance by choosing cash rent contracts. The results supported this idea. They also tested risk aversion by suggesting that crops with higher variability in yields would affect the contract choice. County-level yield data for six crops was used to investigate this claim. The hypothesis was that higher variability in crop yields meant riskier crops. The results reject this hypothesis. These conclusions were used to determine that risk is not a sufficient strategy to explain contract choice, and that transaction-cost is more useful.

Allen and Lueck found that neither contract is necessarily better than the other. It all depends on the situation. For instance, on occasions when the cost of dividing the crop after harvest is low and the farmer's ability to have a negative impact on the long-term productivity of the soil is high, cropshare is the most likely contract to be chosen. On the other hand, in situations where crop-division costs are high, cash rent will likely be the preferred solution. Additionally, cash rent contracts may include specific verbiage limiting the farmer's ability to degrade the soil.

There is one way that cash rent contracts can be adjusted that reduces the incentive for farmers to overuse the soil. If yields are higher than expected or higher than usual, the cash rent can be adjusted upwards. The likelihood of using one of these contracts increases in situations where the farmers' ability to abuse the land is high. If crops are expensive to divide or easy to

underreport, these adjustment clauses are less likely, as it requires accurate measurement of output.

In conclusion, Allen and Lueck confirmed that using the transaction cost approach is an effective tool to determine the deciding factors of contract choice. The downside to this approach is that many of these factors are not fully measurable, making difficult to use the results of this study to predict future contract choices or determine the appropriate contract. The article perhaps summed it up best by saying, "If economists could directly and cheaply measure the ability of farmers to exploit the soil moisture and nutrients or the number and quality of hay bales taken, then so could landowners, and there would be no contract-design problem." In other words, economists can only do so much to make inferences about driving factors, but cannot offer full-proof solutions to solve all of the contract choice problems or answer all questions. Identifying the incentives present in particular situations is the best way to draw conclusions about what the best contract fit may be. There is no supporting evidence in this article that risk-aversion is an effective theory to determine contract choice. The results of the study found that hay crops, irrigated crops, and crops grown near densely populated areas all increase the likelihood of a cash rent contract being chosen. Growing row crops increases the likelihood that a cropshare contract will be chosen. This study was done in 1992. As agriculture has seen changes in recent decades, contract choice may be driven by other factors or may have experienced changing trends.

2.2 Risk-Sharing Incentives

There are other approaches to consider when researching contract choice. In 2011, Feng Qiu, Barry K. Goodwin, and Jean-Philippe Gervais studied the effect of government payments and government program enrollments on contract choice in *An Empirical Investigation of the*

Linkages between Government Payments and Farmland Leasing Arrangements. It is critical to note that this study considers risk-sharing incentives to be important in determining contract choice. They suggest that it is necessary to consider the growing popularity of hybrid contracts, or flex leases, a mix of cash rent and cropshare of sorts. Essentially, the results show that different government programs have varying effects on contract choice, but can play a role.

Results from *The Role of Risk and Transaction Costs in Contract Design: Evidence from Farmland Lease Contracts in U.S. Agriculture*, an article written by Keita Fukunaga and Wallace E. Huffman in 2009, support both the theory of risk-sharing incentives and transaction costs playing a role in contract choice. Major factors observed in this study include crop type, region, tenant and landlord age and race, number of tenants or landlords, location of landlords, farm income, farm share of total income, and debt. Some of these variables can be interpreted as dependent on risk-preference, while some were seen as indicative of transaction costs.

Chapter 3 – Model

3.1 Binomial Logistic Regression

Data was analyzed using two binomial logistic regressions. One regression analyzed the variables from the tenant survey, while the other regression analyzed variables from the landowner survey. The dependent variable was the type of contract used. If the contract used was a cropshare contract, the variable was shown as a "1". If the contract was a cash rent contract, the variable was shown as a "0". There were several factors to consider as independent variables.

Tenant variables used were whether or not a tenant leases from more than 7 landlords, shown as "num_landlords", whether or not a primary crop grown in the largest lease is a hay crop, shown as "hay", whether or not a primary crop in the largest lease is irrigated, shown as "irr", the annual household income of the tenant, shown as "income", and the region of the state in which the tenant's largest lease is located, shown as "region". These variables are shown in Table 3.1. Tenant Model:

$$Logit(CS) = \alpha + \beta_1 num\_landlords + \beta_2 hay + \beta_3 irr + \beta_4 income + \beta_5 region$$

The variables used for the landowner regression were the total number of leased acres, shown as "leased_acres", the number of tenants the landowner has leases with, shown as "num_tenants", whether or not the landowner's residence is further than 50 miles from their largest lease, shown as "distance_residence", whether or not the tenant is family of the landowner, shown as "family", the risk preference of the landowner, shown as "risk", the age of the landowner, shown as "age", and the region of the state in which the landowner's largest lease is located, shown as "region". Landowner variables are shown in Table 3.2. These independent

variables were used in the binomial logistic regressions to quantify the amount of influence they have on determining whether or not a cropshare contract will be used. Landowner Model:

$$Logit(CS) = \alpha + \beta_1 leased\_acres + \beta_2 num\_tenants + \beta_3 distance\_residence + \beta_4 family + \beta_5 risk + \beta_6 age + \beta_7 region$$

3.2 Tenant Variables

Tenants that work with more than seven landlords are more likely to prefer using a cash rent contract. Cash rent contracts tend to be much simpler than cropshare contracts. There is no sharing of input costs, or dividing of output after harvest. Cash rent contracts have lower transaction costs than cropshare. A tenant with multiple cropshare contracts may have varying proportions of input costs covered by each landowner. The same can be said for the amount of crops shared after harvest. It requires much more time and effort for a tenant to keep record of input costs associated with each separate lease, as well as billing and receiving payments from each landowner in a timely and efficient manner. Once a tenant is working with several landlords, it makes more sense for the tenant to only have to worry about writing a check for each landowner once a month for a fixed cash rent.

If one of the top three crops grown in a tenant's largest lease is a hay crop, the contract more likely to be chosen is cash rent. Bales of hay are typically sold in a private manner, as opposed to selling grain at an elevator. Private sales are more difficult to accurately record and track. Because of this, a tenant has a greater ability to understate production volume in order to keep a greater portion of the revenue for themselves, instead of splitting the crop in the quantities agreed upon in a cropshare contract. Hay may also vary in quality, allowing the tenants to

potentially keep the higher quality bales to themselves. For this reason, a landowner will be more likely to require a cash rent contract. Verifying production quantity and quality increases transaction costs. Hay crops such as alfalfa require less tillage than row crops, meaning there is less of a reason for the tenant to employ extensive or harmful tillage practices that can damage the soil long-term in an attempt to maximize short term production. This allows the landowner to be more comfortable with using a cash rent lease.

A tenant is more likely to prefer a cash rent contract for irrigated acres. Most often, a farmer will grow row crops on irrigated ground. Row crops typically require a higher amount of tillage, which can be damaging to soils and decrease long-term soil moisture, but irrigation minimizes this affect. Irrigation also provides some amount of guarantee that a decent crop will be grown, barring any extreme circumstances. Dryland crop yields are subject to more volatility due to uncontrollable moisture content throughout the season. Because there is a certain degree of guaranteed minimum yields, a tenant may opt towards a cash rent contract, because there is less risk of having to pay a flat rate in the event of an unsuccessful crop. This puts the irrigation variable in the risk-sharing category. A tenant will also benefit from not having to share the output of a consistently high producing crop.

The higher the annual household income of the tenant, the more likely the contract chosen will be cash rent. Income falls into the risk-sharing category. The higher income allows the tenant to have a higher preference for risk. Cash rent contracts are riskier for a tenant because in a bad crop year with less income, the cash rent payment remains the same. In a cropshare contract, the amount of crop output that goes to the landowner decreases with yield loss, costing the tenant less, making a cropshare contract less risky. In a good year, a tenant may be able to make more in a cash rent contract than in a cropshare contract because none of the output is

going to the landowner. In a cash rent contract on a good year, once the value of the crop that would typically go to the landowner in a cropshare situation surpasses the value of the cash rent, the tenant essentially wins. In a cropshare contract on a good year, the tenant loses if the value of the crop going to the landowner is more than what the cash rent would have been. Tenants with high income can afford to risk paying cash rent on a bad year, in hopes that they will receive greater benefits by retaining all of the crop outputs in good years. In addition, off-farm income can be the primary source of higher household income, resulting in the opportunity for a tenant to assume higher risk with farm operations. Tenant household incomes are divided into six categories. The survey allowed the tenants to express whether they made less than $25,000, between $25,000 and $50,000, between $50,000 and $80,000, between $80,000 and $100,000, between $100,000 and $150,000, or greater than $150,000.

The region variable is essentially a control variable. Each region in Kansas grows their own unique combination of crops. Regions were determined using Kansas' crop reporting districts for this study, shown in Figure 3.1. Some regions have more access to irrigation, while some regions receive more rainfall. Some regions have sandier soils than others. These and many other characteristics cause regions to differ in crops grown, such as more hay crops or row crops. Because so many different aspects, such as climate, soil type, landscape and more, determine what crops are grown, it is difficult to predict what type of contract will be used based solely on region. Two tenant-landowner relationships could be on complete opposite sides of the spectrum, one that clearly makes the most sense for cropshare and one for cash rent, and be located in the same region. Even if region isn't the driving force behind contract choice, there may still be differing trends in contract choice between regions. This logic applies to both tenant contract preference and landowner contract preference. This variable was not intended to result in an

interpretation of a significant contributing factor to contract choice. Therefore, no predictions were made regarding the coefficient sign of this variable.

Table 3.1 Tenant Variables with Expected Coefficient Sign (+/-)

num_landlords = Tenant works with 8+ landlords (-)
hay = Whether or not hay is one of top three crops grown in largest lease (-)
irr = Whether or not any of the top three crops are irrigated (-)
income = Tenant's total annual household income (-)
region = Area of Kansas based on Crop Reporting Districts compared to NW Kansas
20 = West Central Kansas
30 = South West Kansas
40 = North Central Kansas
50 = Central Kansas
60 = South Central Kansas
70 = North East Kansas
80 = East Central Kansas
90 = South East Kansas

3.3 Landowner Variables

The more acres a landowner leases, the more likely the landowner is to prefer cash rent contracts. A larger farm means there are more crops to monitor and divide in a cropshare contract, which can be costly and time consuming. Higher acres may also mean a higher number of tenants, though this is not guaranteed. These reasons place this variable in the transaction cost category. Farm size could also be seen as a risk-sharing factor. The larger the farm, the more income can be affected by a bad crop year, proportionally. To minimize risk, a landowner may prefer cash rent contracts.

Similar to before, the more tenants a landowner works with, the more likely cash rent contracts will be used. If each tenant requires the landowner to pay different amounts of input costs, then each additional tenant requires more time and effort by the landowner. Landowners must also verify the appropriate amounts of crop output are received, as well as fair quality. At some point, the landowner will not have enough resources to keep track of every detail of each cropshare contract, making cash rent the contract of choice. The number of tenants is a transaction cost issue. Although cash rent may be preferred, it may not be the best fit for every tenant. As mentioned, some tenants may have tendencies to abuse cash rent contracts by overusing inputs and might require a certain amount of attention from the landowner to ensure that the land is not being exploited. A cropshare contract also decreases the incentive and reward to a tenant who has these tendencies. In these cases, the landowner may choose to use a cropshare contract with unfavorable tenants to deter the negative incentives provided by cash rent contracts.

If a landowner's residence is greater than 50 miles from their largest lease, the landowner is more likely to prefer cash rent contracts. Landowners that use cropshare contracts tend to be more involved in decision making and day to day operations. Cropshare landowners are more involved because their revenue depends on the success of the crop, as opposed to cash rent landowners earning revenue regardless of how well the crop produces. The ability of a landowner to be involved in the process diminishes when the landowner resides further away from the cropland. The closer the landowner lives to the leased land, the greater their ability to be present and informed. It is more costly for the landowner to use a cropshare contract when absent, because it is more difficult to be involved and to verify tenant reports on crop output, placing this variable into the category of transaction cost theory.

If a landowner and tenant are family, the contract more likely to be chosen is a cropshare contract. Most likely, a landowner and a tenant that are family will have a relationship that results in the landowner being more involved in the decision making or at least more aware of the day to day status of the operation. If a landowner has family members involved in farming, the landowner has more than likely been involved in farming themselves, or has been exposed to it in some way. Because of this, the landowner will likely be more knowledgeable about farming, and able to contribute more in a cropshare scenario. In general, family members are more supportive of one another, and less likely to only be worried about themselves. There is a level of trust. Because of this, each party will be more willing to take on and share risk. This does not mean that using a cropshare contract with family decreases risk to the landowner. Cropshare contracts are still inherently more risky, but being family causes the landowner to be more willing to share risk with the tenant. Because of this, the family variable does not fit into either the transaction cost or the risk-sharing theory. Cropshare contracts allow both parties to work together to maximize production and for everyone involved to prosper. In many ways this comes more natural to family members. Of course, this may also cause families to overlook critical details or to think illogically, which may result in a situation where cash rent is never considered, even if it is the appropriate choice.

The higher the landowner's risk preference, the more likely the contract chosen will be cropshare. As discussed before, cropshare contracts are riskier for landowners because on a bad crop year, revenue can be severely hurt, where a cash rent contract guarantees a level of income. If a landowner is tends to take more financial risks, they may be more likely to prefer a cropshare contract in hopes that the crop will produce high yields and provide a higher return to the

landowner than a cash rent rate, at the risk of income being hurt due to a failed crop. This variable falls in the risk-sharing category.

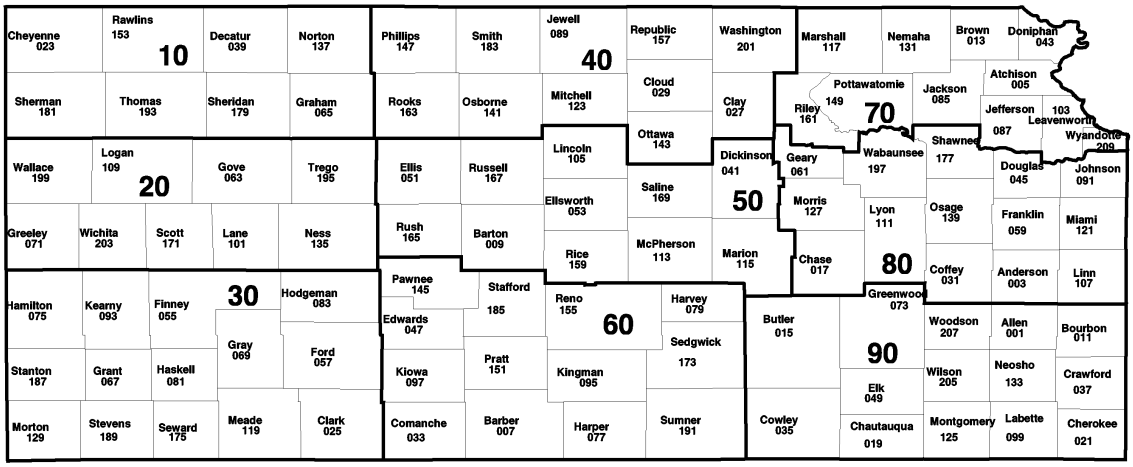
The older a landowner is, the more likely the landowner will prefer a cash rent contract. This is largely based off of risk. In theory, the older someone gets, the less risky they become. This is common in all financial decisions, including retirement funds and investments. If a landowner becomes less risky with age, the more likely they are to prefer the guaranteed and steady income of a cash rent contract. In addition, old age may prevent a landowner from being able to be involved in the farming process, making it harder for them to justify a cropshare contract.

Table 3.2 Landowner Variables with Expected Coefficient Sign (+/-)

leased_acres = Total number of acres leased (-)
num_tenants = Number of tenants a landowner works with (-)
distance_residence = Whether or not landowner residence is more than 50 miles from lease (-)
family = Whether or not the tenant is a family member of the landowner (+)
risk = Landowner willingness to take on financial risk on scale of 1-10 (+)
age = Years of age of landowner (-)
region = Area of Kansas based on Crop Reporting Districts compared to NW Kansas
20 = West Central Kansas
30 = South West Kansas
40 = North Central Kansas
50 = Central Kansas
60 = South Central Kansas
70 = North East Kansas
80 = East Central Kansas
90 = South East Kansas
100 = Out of state

Because the model is based on a binomial logistic regression, if the coefficient for each independent variable is found to be negative, this means that an increase in the independent variable, for all continuous variables, is more likely to influence the contract chosen to be cash rent. If the coefficient is positive, the contract more likely to be chosen with an increase in the independent variable is cropshare. If the independent variable is also binary, then the presence of the variable results in the variable showing "1", or "0" if the variable is not present. For instance, hay crops are either grown ("1") or not grown ("0"). If the coefficient of these binomial independent variables is negative, the presence of that variable is more likely to influence the contract chosen to be cash rent. If the coefficient is positive, the presence of the variable causes the contract more likely to be chosen to be cropshare. The binomial variables are denoted by "1." before their variable name in the results.

Figure 3.1 Kansas Crop Reporting Districts



Chapter 4 – Data

4.1 KFMA Survey

Data was used from a survey of tenants and landowners. The survey was not created specifically for this study. Rather, this study was created based off of the potential to answer additional research questions using the survey. Contact information was from the Kansas Farm Management Association database, which only gives us access to tenants. Surveys were distributed to 1,985 tenants. The survey was distributed using a snowball method. Tenants were sent both a copy of a tenant survey and a landowner survey. Tenants were then instructed to deliver the landowner survey to the landowner of their largest lease. The tenants and landowners would then return the completed surveys directly back to the surveyor. There were 3,970 surveys sent out in total, with responses from 513 tenants and 398 landowners.

The surveys for each group, while similar, were not identical and asked questions specific to each party. There were many important questions from this survey that could be used to derive the reasoning behind contract choice. The questions pertaining to the factors determined to be most influential on contract choice were used for this experiment. Tenants may have leases with multiple landowners, while a landowner may have leases with many tenants. Tenants and landowners were each asked what type of contract they use for their largest lease, be it cropshare, cash rent, or flex lease. About 35 percent of tenants were using cropshare contracts for their largest lease, about 60 percent used fixed cash rent, and about 5 percent used flex lease contracts. For the landowners, cropshare contracts made up about 40 percent of the contracts used, cash rent consisted of about 58 percent, and flex lease contracts made up the remaining 2 percent. While there were over 500 tenant responses and nearly 400 landowner responses, not every

respondent answered every question in the survey. Because of this, sample size for some questions are less than others.

Relevant tenant information from the survey includes the number of landowners that a tenant has leases with, the region of the state in which the tenant's largest lease is located, whether or not a primary crop grown in the largest lease is a hay crop, whether or not a primary crop in the largest lease is irrigated, and the annual household income of the tenant.

The landowner survey also provided important information, such as the total number of acres leased, the number of tenants the landowner has leases with, the distance between the largest lease and the landowner's residence, whether or not the tenant is family of the landowner, the risk preference of the landowner, the age of the landowner, and the region of the state in which the landowner's largest lease is located.

Shown in Table 1.1, 124 tenants reported cropshare as the contract type for their primary lease. 212 farmers used cash rent, while 17 used flex leases. For landowners, 63 reported using cropshare, 92 used cash rent, and 4 used flex leases, as seen in Table 1.2.

Table 4.1 Tenant Contract Type

	Frequency	Percent
Cropshare	128	35.36
Cash Rent	216	59.67
Flex Lease	18	4.97
Total	362	100

Table 4.2 Landowner Contract Type

	Frequency	Percent
Cropshare	63	39.62
Cash Rent	92	57.86
Flex Lease	4	2.52
Total	159	100

4.2 Data Summary Tenants

From the tenant survey, the number of landowners each tenant works with ranged from 1-70, with an average of 7.3 landowners, shown in Table 4.3. This variable was categorized to account for a skewed distribution. The new variable considers whether or not a tenant leases from more than seven landowners. About 34 percent of tenants leased from eight landowners or more, while about 66 percent lease from seven or fewer, shown in Table 4.4. Of tenants with eight or more landlords, 37 percent used a cropshare contract, shown in Table 4.9.

Based on crop reporting districts for the location of each of the tenant's largest lease, 5.87 percent was located in north west Kansas, 2.23 percent was located in west central Kansas, 4.47 percent was located in south west Kansas, 9.78 percent was located in north central Kansas, 16.76 percent was located in central Kansas, 15.64 percent was located in south central Kansas, 11.73 percent was located in north east Kansas, 15.64 was located in east central Kansas, and 17.88 percent was located in south east Kansas, shown in Table 4.8.

Hay crops were one of the top three crops grown in a tenant's largest lease only 3.93 percent of the time (17 out of 433), shown in Table 4.5. Of these instances, cropshare contracts were used 65 percent of the time (11 out of 17), shown in Table 4.10. At least one of the top three crops grown in a tenant's largest lease was irrigated in 59.12 percent of tenants (256 out of 433), shown in Table 4.6. Of the leases with irrigation, 30 percent used a cropshare contract (54 out of 179 who answered both the contract type question and the irrigation question), shown in Table 4.11.

Of the annual household income of all tenants, 6.09 percent was below $25,000, 15.24 percent was between $25,000-$50,000, 24.93 percent was between $50,000-$80,000, 11.36 percent was between $80,000-$100,000, 20.78 percent was between $100,000-$150,000, and

21.61 percent was above $150,000, shown in Table 4.7. Distribution of income and use of cropshare contracts are shown in Table 4.12.

Table 4.3 Number of Landlords

	Percentiles	Smallest
1%	1	1
5%	1	1
10%	2	1
25%	3	1
50%	5	
		Largest
75%	9	27
90%	15	41
95%	18	57
99%	27	70
Obs.		357
Mean		7.3026
Std. Dev.		6.9713

Table 4.4 Tenant Leases from 8+ Landlords (0=No, 1=Yes)

	Frequency	Percent
0	236	66.11
1	121	33.89
Total	357	100

Table 4.5 Hay is Grown (0=No, 1=Yes)

	Frequency	Percent
0	416	96.07
1	17	3.93
Total	433	100

Table 4.6 Irrigation is Used (0=No, 1=Yes)

	Frequency	Percent
0	177	40.88
1	256	59.12
Total	433	100

Table 4.7 Tenant Annual Household Income ($)

	Frequency	Percent
<25K	22	6.09
25K-50K	55	15.24
50K-80K	90	24.93
80K-100K	41	11.36
100K-150K	75	20.78
>150K	78	21.61
Total	361	100

Table 4.8 Region (Tenants)

	Frequency	Percent
10	23	6.23
20	8	2.17
30	17	4.61
40	35	9.49
50	62	16.80
60	58	15.72
70	44	11.92
80	59	15.99
90	63	17.07
Total	369	100

Table 4.9 Number of Landlords and Cropshare

Cropshare: (0=No, 1=Yes)	8+ Landlords (0=No, 1=Yes): 0	1	Total
0	136	71	207
1	81	42	123
Total	217	113	330

Table 4.10 Hay and Cropshare

Cropshare: (0=No, 1=Yes)	Hay Grown (0=No, 1=Yes): 0	1	Total
0	210	6	216
1	117	11	128
Total	327	17	344

Table 4.11 Irrigation and Cropshare

Cropshare: (0=No, 1=Yes)	Irrigation Used (0=No, 1=Yes): 0	1	Total
0	91	125	216
1	74	54	128
Total	165	179	344

Table 4.12 Income and Cropshare

Cropshare: (0=No, 1=Yes)	Annual Household Income ($): <25K	25K-50K	50K-80K	80K-100K	100K-150K	>150K	Total
0	15	33	41	19	39	37	184
1	5	15	29	13	20	30	112
Total	20	48	70	32	59	67	296

4.3 Data Summary Landowners

From the landowner survey, the total number of leased acres ranged from 0-8,230 acres. The average number of leased acres was 842 acres, shown in Table 4.13. The number of tenants each landowner worked with ranged from 0-10 tenants, with an average of 1.34 tenants, shown in Table 4.14. A distribution of number of tenants is shown in Table 4.15. This range was notably less than the number of landlords that tenants worked with. The number of tenants a landowner works with and their contract type is shown in Table 4.22.

The distance between the landowner's residence and their largest lease ranged from 0-1,600 miles, with an average of 59 miles, shown in Table 4.16. This variable was categorized to account for skewed data. The new variable shows whether or not a landowner's residence is 50 miles or further from their largest lease. 12 percent of landowners reside 50 miles or further from their largest lease, shown in Table 4.17. Table 4.23 shows the number of landowners residing 50 miles or more from their largest lease that use cropshare contracts.

Based on crop reporting districts for the location of each of the landowner's majority of owned cropland, 7.41 percent was located in northwest Kansas, 1.23 percent was located in west central Kansas, 8.02 percent was located in southwest Kansas, 7.41 percent was located in north central Kansas, 15.43 percent was located in central Kansas, 17.90 percent was located in south central Kansas, 11.72 percent was located in northeast Kansas, 16.67 percent was located in east central Kansas, 13.58 percent was located in southeast Kansas, and 0.62 percent was located out-of-state, shown in Table 4.18.

Thirty-one percent of all landowners were family with the tenant of their largest lease, shown in Table 4.19. Among these, 38 percent of landowners who were family with their tenant used a cropshare contract, shown in Table 4.24. On the other hand, of landowners who were not family with their tenant, only 11 percent used a cropshare contract.

When asked to rate their willingness to take financial risks on a scale of 1-10, 2.89 percent answered 1, 1.44 percent answered 2, 5.78 percent answered 3, 4.69 percent answered 4, 14.08 percent answered 5, 9.75 percent answered 6, 19.86 percent answered 7, 21.66 percent answered 8, 9.03 percent answered 9, and 10.83 percent answered 10, shown in Table 4.20. Risk preference and contract type is shown in Table 4.25. Landowner age ranged from 31 to 96 years of age, with an average age of 69 years, shown in Table 4.21.

Table 4.13 Total Leased Acres

	Percentiles	Smallest
1%	51	32
5%	96.5	51
10%	142	74
25%	289	78
50%	610	
		Largest
75%	1002.5	2700
90%	1925	3200
95%	2241.5	6600
99%	6600	8230
Obs		160
Mean		841.68
Std. Dev.		980.135

Table 4.14 Number of Tenants

	Percentiles	Smallest
1%	0	0
5%	1	0
10%	1	0
25%	1	0
50%	1	
		Largest
75%	1	3
90%	2	5
95%	3	5
99%	5	10
Obs		155
Mean		1.3419
Std. Dev.		0.9832

Table 4.15 Number of Tenants

	Frequency	Percent
0	4	2.58
1	113	72.90
2	30	19.35
3	5	3.23
5	2	1.29
10	1	0.65
Total	155	100

Table 4.16 Distance to Landowner Residence (miles)

	Percentiles	Smallest
1%	0	0
5%	0	0
10%	0	0
25%	0	0
50%	5	
		Largest
75%	15	940
90%	80	1250
95%	260	1400
99%	1400	1600
Obs		162
Mean		58.7901
Std. Dev.		218.7121

Table 4.17 Landowner Residence 50+ Miles from Lease (0=No, 1=Yes)

	Frequency	Percent
0	143	87.65
1	20	12.35
Total	162	100

Table 4.18 Region (Landowner)

	Frequency	Percent
10	12	7.41
20	2	1.23
30	13	8.02
40	12	7.41
50	25	15.43
60	29	17.9
70	19	11.73
80	27	16.67
90	22	13.58
100	1	0.62
Total	162	100

Table 4.19 Tenant is Family (0=No, 1=Yes)

	Frequency	Percent
0	214	69.03
1	96	30.97
Total	310	100

Table 4.20 Willingness to Take Financial Risk (1=Unwilling, 10=Willing)

	Frequency	Percent
1	8	2.89
2	4	1.44
3	16	5.78
4	13	4.69
5	39	14.08
6	27	9.75
7	55	19.86
8	60	21.66
9	25	9.03
10	30	10.83
Total	277	100

Table 4.21 Landowner Age

	Percentiles	Smallest
1%	31	31
5%	48	31
10%	53	31
25%	62	34
50%	69	
		Largest
75%	77	92
90%	85	93
95%	88	93
99%	93	96
Obs		282
Mean		68.6277
Std. Dev.		12.4669

Table 4.22 Number of Tenants and Cropshare

Cropshare:	**Number of Tenants**						
(0=No, 1=Yes)	**0**	**1**	**2**	**3**	**5**	**10**	**Total**
0	3	72	15	3	1	0	94
1	1	41	15	2	1	1	61
Total	4	113	30	5	2	1	155

Table 4.23 Distance to Residence and Cropshare

Cropshare:	**Residence 50+ Miles Away (0=No, 1=Yes):**		
(0=No, 1=Yes)	**0**	**1**	**Total**
0	87	13	100
1	55	7	62
Total	142	20	162

Table 4.24 Family and Cropshare

Cropshare: (0=No, 1=Yes)	Tenant is Family (0=No, 1=Yes): 0	1	Total
0	190	57	247
1	24	39	63
Total	214	96	310

Table 4.25 Risk and Cropshare

Cropshare:	Willingness to Accept Financial Risk										
(0=No, 1=Yes)	1	2	3	4	5	6	7	8	9	10	Total
0	5	1	12	13	29	18	43	50	21	28	220
1	3	3	4	0	10	9	12	10	4	2	57
Total	8	4	16	13	39	27	55	60	25	30	277

Chapter 5 – Results

Binomial logistic regressions tend to be a bit difficult to interpret. Regression coefficients in a logit function show the amount of change in the predicted log odds of cropshare contracts being used that would be predicted by a one unit increase in the independent variable, holding all other variables constant. In other words, they are the logarithm of the odds of the dependent variable occurring with a change in the independent variable. To make this coefficient easier to interpret, the log odds are exponentiated, resulting in odds ratios. An odds ratio is interpreted as the odds of cropshare being chosen when the independent variable is changing divided by the odds of cropshare being chosen when no change occurs. P-Values are used to test the null hypothesis that the coefficient will be zero. For this experiment, if variables have a P-Value less than 0.1, the null hypothesis is rejected and the variables are considered significantly different from zero. However, so if a coefficient has a P-Value relatively close to 0.1, it may still be considered reasonably significant.

The results of these regressions were especially difficult to interpret, as there were several variables that resulted in coefficients opposite of the predicted sign as well as several variables shown to be not statistically significant. Not counting region, the tenant regression resulted in three of four variables being statistically significant (hay, irrigation and income), while two of the four variables produced coefficients that followed the intuition and matched the predicted sign (number of landlords and irrigation). These results can be seen in Table 5.1.

The landowner results were even more counterintuitive. One variable out of six (number of tenants) is considered statistically significant, while three more variables' P-Values are reasonably close (family, risk and age). Only three of six variables matched the predicted

coefficient sign and aligned with intuition (leased acres, family and age). Landowner results are shown in Table 5.2.

5.1 Tenant Results

According to regression output, if a tenant works with more than seven landlords, the more likely they were found to use a cash rent contract, shown by a negative coefficient. This was expected, as cropshare contracts require more attention to ensure both parties are providing their inputs and receiving their fair share of outputs. Because of this, transaction costs are higher for cropshare contracts than cash rent contracts when increasing the number of landlords. Leasing from a higher number of landowners means the obvious contract choice will be cash rent to avoid the extra work. The value of the coefficient means that a tenant leasing from eight or more landlords resulted in a decrease of 0.055 in the log odds of cropshare contracts being chosen compared to a tenant that leases from seven or less landlords. Converting the log odds to an odds ratio results in an odds ratio of 0.946, or 1/1.057. Because this odds ratio is less than one, this means the more likely contract to be chosen is cash rent. The odds ratio says that the odds of cropshare contracts being chosen are greater when no change to the number of landlords occurs. However, the P-Value for the number of landlords a tenant works with was 0.840, meaning the coefficient is not significantly different from zero.

The first variable with an unexpected sign was whether or not a hay crop is grown. The variable was predicted to be negative, which would indicate that growing a hay crop would result in the more likely contract being cash rent. However, the results show that the presence of a hay crop increased the log odds of using a cropshare contract by 1.325. Converting the log odds to an odds ratio results in an odds ratio of 3.764, or 3.764/1. Because this odds ratio is greater than one, this means the more likely contract to be chosen is cropshare. The odds ratio says that the

odds of cropshare contracts being chosen are greater with the presence of hay crops. As noted in the data summary, only 3.55 percent of tenants reported a hay crop as one of their top three crops grown in the previous year. Of these, just over half used cropshare contracts. I suspect there was simply not a large enough pool of data to effectively determine the impact of hay crops. Also, a hay crop may have been grown that particular year but may not regularly be a top three crop on the farm, while the cropshare may be the contract used in a more long-term fashion. This variable was statistically significant, with a P-Value of 0.020.

Irrigated crops were found to result in cash rent contacts being more likely than cropshare, as predicted. A tenant can experience many benefits to having an irrigated crop under a cash rent contract, as they are basically guaranteed a more productive crop and both the tenant and landowner do not have to worry about reducing soil moisture by overusing tillage practices. A tenant is exposed to less risk than when farming dryland, as their yields are somewhat protected by the irrigation. Because of this, a tenant can afford to take on more risk with a cash rent contract. The value of the coefficient means using irrigation resulted in a decrease of 0.619 in the log odds of cropshare contracts being chosen compared to a tenant does not irrigate. Converting the log odds to an odds ratio results in an odds ratio of 0.539, or 1/1.857. Because this odds ratio is less than one, this means the more likely contract to be chosen is cash rent. The odds ratio says that the odds of cropshare contracts being chosen are greater when no irrigation is used. The P-Value for irrigation was 0.018, meaning it was also statistically significant.

An increase in tenant income resulted in cropshare being the preferred contract. This was not what the variable was predicted to show. The intuition was based around income determining the risk preference of the tenant. However, tenants with low risk preferences could still have high incomes. Clearly, higher income does not guarantee a tenant has a higher risk preference, which

does not guarantee a cash rent contract. While logical to think higher income results in higher risk preference, farmers that take too many risks may not consistently capitalize on the potential rewards. With the volatility of recent agricultural production and markets, high risk farmers have likely not been experiencing high rewards. Because of this, low risk tenants that decrease their risk exposure by choosing cropshare contracts or using less risky farming methods may actually be the tenants that have come out with higher incomes. The value of the coefficient means that increasing a tenant's annual household income resulted in an increase of 0.157 in the log odds of cropshare contracts being chosen compared to a tenant that's income stays the same. Converting the log odds to an odds ratio results in an odds ratio of 1.169, or 1.169/1. Because this odds ratio is greater than one, this means the more likely contract to be chosen is cropshare. The odds ratio says that the odds of cropshare contracts being chosen are greater when no change to the tenant's income occurs. The income coefficient resulted in a P-Value of 0.055, meaning the variable is statistically significant.

Table 5.1 Tenant Regression Model Results

Variable	Coefficient	Standard Error	P-Value
1.num_landlords	-0.05545	0.2747	0.840
1.hay	1.3255*	0.5711	0.020
1.irr	-0.6188*	0.2613	0.018
income	0.1567*	0.0817	0.055
region			
20	-0.5726	0.9952	0.565
30	-0.4688	0.7706	0.543
40	-0.7586	0.6261	0.226
50	-0.5812	0.5502	0.291
60	-1.1607	0.5698	0.042
70	-0.3226	0.5917	0.586
80	-0.4909	0.5671	0.387
90	-0.8533	0.5634	0.130
Observations			281
Pseudo R2			0.0527

5.2 Landowner Results

The result of the second regression, depicting landowner variables, begins with the number of leased acres. An increase in acres leased led to a slight increase in the likelihood of cash rent contracts being chosen. This coincides with the intuition behind predicting this variable's result. The coefficient is miniscule at -0.00003 and the P-Value is 0.903, meaning this variable is not significantly different from zero. The coefficient tells us that increasing the number of leased acres resulted in a decrease of 0.00003 in the log odds of cropshare contracts being chosen compared to a landowner whose leased acres remains the same. Converting the log odds to an odds ratio results in an odds ratio of 0.999, or 1/1.00003. Because this odds ratio is less than one, this means cash rent is more likely to be chosen. The odds ratio says that the odds of cropshare contracts being chosen are greater when no change to the number of leased acres occurs.

According to the regression results, increasing the number of tenants causes cropshare contracts to be more likely than cash rent. Opposite of what was predicted, this can only be explained by the fact that in a cropshare contract, the tenant bears the majority of the workload associated with tedious details of managing the lease. All cropshare contracts are typically unique in some way, but in most cases, managing a cropshare contract presents more responsibilities to tenant than a landlord. This decreases the value of the claim that the increased billing and crop dividing tasks associated with cropshare contracts will cause cash rent contracts to be chosen when additional tenants involved. While the number of landlords that a tenant works with ranged from 1-70, the number of tenants a landowner works with only ranged from 1-10. In that range, only one landowner worked with ten tenants and the second highest amount of tenants dropped to five. Because of this decreased variance in number of leasing partners, I

believe the type of contract is less of an issue than if the number of tenants were higher. The value of the coefficient means that increasing the number of tenants resulted in an increase of 0.629 in the log odds of cropshare contracts being chosen compared to a landowner whose number of tenants remains the same. Converting the log odds to an odds ratio results in an odds ratio of 1.877, or 1.877/1. Because this odds ratio is greater than one, this means the more likely contract to be chosen is cropshare. The odds ratio says that the odds of cropshare contracts being chosen are greater when the number of tenants increases.

Opposite what was predicted, if a landowner lives further than 50 miles from the largest lease, cropshare contracts become more likely to be chosen. This variable's result is difficult to explain. Cropshare contracts typically require the landowner have some sort of involvement in farm decisions or be aware of day-to-day details. The further a landowner resides from the property, the more difficult this becomes. This also requires the landowner to verify the crop yield and shares. Not surprisingly, the P-Value for this coefficient is 0.917, meaning this variable is not statistically significant. A landowner living further than 50 miles from the largest lease resulted in an increase of 0.07 in the log odds of cropshare contracts being chosen compared to a landowner resides within 50 miles. Converting the log odds to an odds ratio results in an odds ratio of 1.073, or 1.073/1. Because this odds ratio is greater than one, this means the more likely contract to be chosen is cropshare. The odds ratio says that the odds of cropshare contracts being chosen are greater when the landowner lives further than 50 miles. Only 20 of 162 landowners lived further than 50 miles from their largest lease. This simply may not be a large enough pool of data to accurately determine the affect of an absent landowner.

Another accurately predicted variable was whether or not a tenant is family with the landowner. Having a tenant that is family results in cropshare contracts being more likely to be

chosen than cash rent contracts. As discussed above, family members tend to be naturally more involved in the day-to-day business of the farm, making sense for them to prefer cropshare contracts to get a return for their involvement. A landowner's largest tenant being family resulted in an increase of 0.499 in the log odds of cropshare contracts being chosen compared to a landowner-tenant relationship that is not family. Converting the log odds to an odds ratio results in an odds ratio of 1.647, or 1.647/1. Because this odds ratio is greater than one, this means the more likely contract to be chosen is cropshare. The odds ratio says that the odds of cropshare contracts being chosen are greater when the landowner and tenant are related. With a P-Value of 0.271, this result is not very statistically significant.

The results of risk preference showed that landowners with more willingness to accept financial risk were more likely to prefer cash rent contracts, even though the intuition determined that cropshare contracts should be more prominent. This coefficient is also counterintuitive and difficult to understand. As seen in the data summary, there were more cash rent contracts used for nearly every quantity of risk preference, with only 57 of 277 total respondents using cropshare. This variable has a reasonable P-Value of 0.132. Higher risk preference resulted in a decrease of 0.138 in the log odds of cropshare contracts being chosen compared to a landowner-tenant relationship that is not family. Converting the log odds to an odds ratio results in an odds ratio of 0.871, or 1/1.148. Because this odds ratio is less than one, this means the more likely contract to be chosen is cash rent. The odds ratio says that the odds of cash rent contracts being chosen are greater when the landowner is more willing to accept financial risk.

The greater the age of the landowner, the more likely the landowner will prefer cash rent contracts. The coefficient of age was correctly predicted. As a landowner ages, risk preferences tend to decrease. This results in a preference for cash rent contracts, as there is less income

variance and less risk than cropshare contracts. With a coefficient of -0.0302 and a P-Value of 0.104, we see that increasing age results in a decrease of the log odds of choosing cropshare by 0.0302. This translates to an odds ratio of 0.97, or 1/1.0307. This slight decrease in odds of choosing cropshare is fairly significant. The odds of cash rent contracts being chosen are greater as the landowner ages. The change in odds is fairly small, indicating that a one-year change in landowner age does not result in a drastic change of contract choice, but a change of ten years will more largely affect the outcome.

Table 5.2 Landowner Regression Model Results

Variable	Coefficient	Standard Error	P-Value
leased_acres	-0.00003	0.0003	0.903
num_tenants	0.6296*	0.3793	0.097
1.distance_residence	0.0702	0.6762	0.917
1.family	0.4990	0.4538	0.271
risk	-0.1378	0.0914	0.132
age	-0.0302	0.0186	0.104
region			
20	-1.3688	1.6902	0.418
30	-1.9861*	1.1097	0.073
40	-1.8007	1.1205	0.108
50	-2.3954*	1.0207	0.019
60	-2.6595*	1.0174	0.009
70	-1.6138	1.0714	0.132
80	-1.8375*	1.0207	0.072
90	-1.6401	1.0333	0.112
Observations			130
Pseudo R2			0.1272

Half of all variables fell into the transaction cost theory, while half were considered risk-sharing factors, with the family variable falling into a category of its own, shown in Table 5.3 and Table 5.4. The number of acres leased qualified for both transaction cost and risk-sharing

theories. Of the five transaction cost variables, two resulted in the predicted contract type. Three of five risk-sharing variables came back as predicted. Speaking strictly from a statistical significance P-Value set at 0.1, two transaction cost variables were significant and two risk-sharing variables were significant. However, two (possibly even three) other risk-sharing variables were very close to being significant. All things considered, it is clear that both transaction cost theory and risk-sharing incentives are viable approaches to determining contract choice.

Table 5.3 Tenant Principal Agent Theory

Variable	Transaction Cost	Risk Sharing	Other	Sign as Predicted	P-Value
Number of Landlords	X			X	0.84
Hay Grown	X				0.02
Irrigation Used		X		X	0.018
Tenant Income		X			0.055

Table 5.4 Landowner Principal Agent Theory

Variable	Transaction Cost	Risk Sharing	Other	Sign as Predicted	P-Value
Leased Acres	X	X		X	0.903
Number of Tenants	X				0.097
Distance to Residence	X				0.917
Family			X	X	0.271
Risk		X			0.132
Age		X		X	0.104

Chapter 6 – Conclusion

The purpose of this study was to analyze many of the characteristics of tenant-landowner relationships to determine which factors made the largest impact on contract choice between cropshare and cash rent. This study was intended to educate tenants and landowners in the agriculture community on factors and implications to consider when determining which type of contract to use. While there are some takeaways from the results, many of the results were contradictive of intuition and inconsistent with logic behind predictions. Had the sample size been significantly larger, I believe the results would begin to align with expected outcomes.

One problem with this study is the fact that the questions are asked about what tenants and landowners are currently doing on their farm. Instead, the survey could have been designed to analyze characteristics about farms and relationships and apply them towards questions on the future. Future research may include questions on satisfaction with current leases and what tenants and landowners would change or do different with their next lease. Leases other than their largest lease should also be considered to get a better idea of what each tenant or landowner uses most often as opposed to one specific lease.

There are many reasons the results were not as clear-cut and predictable as initially thought. Several factors can be present at one time when coming to a decision on contract choice, so some details must be set aside in order to determine which characteristic is the most important for each relationship. Several details and situations may be occurring that a survey could never capture. For example, an older landowner may prefer cropshare contracts, but switches his leases to cash rent to make it easier for his family to manage before he passes away. On the other hand, a tenant farmer who is approaching retirement may also switch from cropshare to cash rent to make it easier for his successors.

Every situation is different. One tenant may prefer cash rent because he works with a dozen different landowners, even though two of them are relatives with high risk preferences and three others are young farmers themselves who desire to be involved in day-to-day decisions. Because of situations like this, not every factor is going to match the intuition behind that specific characteristic. Although there is sound reasoning as to why the presence of a hay crop in a lease should result in a cash rent contract being chosen, other factors may overrule this detail. The result of this complexity of relationships can make the survey data appear incorrect or illogical. But the truth is, there is no easy way to dissect every tenant-landowner relationship and determine the number one driving factor behind contract choice in order to explain all the underlying factors that maybe just don't make sense.

The most important information from this study is the conversation about what incentives different contracts type provide, and how these implications may be considered and applied, a topic that has been popular in similar studies of the past. Although not all of the survey questions considered relevant to this study provided logical results, it is important to note that they should still be considered in the decision process of contract choice.

Additional research could be done to further explore the most influential variables of contract choice. The study would be more thorough if a researcher could obtain accurate and equal amounts of data from a much larger sample size. I would suggest the survey ask the tenants and landowners to rank factors, like those considered in this study, in order of most important or influential. I would also ask the tenants and landowners to rank their satisfaction with their current lease arrangements. Although the results of this study were inconclusive, this study offers good information for tenants or landowners to consider when deciding on future contracts, as well as being a good example for future research to be based off of.

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Appendix

Tenant and Landowner Surveys:

KANSAS STATE UNIVERSITY

Producer/Tenant Questionnaire

A SURVEY OF YOUR OPINIONS

*The **goal** of this research is to understand tenants' and landowners' opinions about agricultural management and their interest in participating in Farm Bill programs. Results will help to identify ways to improve programs for long-term agricultural profitability and environmental sustainability.*

Your opinions matter! Please help us learn from you by completing this questionnaire.

Remember, all individual responses are anonymous and confidential.

Thank you for taking our survey. You are helping to inform the design of future Farm Bill Programs that better reflect the views and concerns of producers and landowners in Kansas.

WHO SHOULD FILL OUT THIS SURVEY?

Do you grow grain crops *(ex. corn, soybeans, wheat)* **on land that you own or land that you lease?**

☐ **NO** ⟹ **If "NO,"** we do not need you to complete this survey, but it is very important for us to know that you received this questionnaire. Please return this questionnaire to us using the postage-paid envelope provided. Thank you!

☐ **YES** ⟹ **If "Yes," please continue to the next question.**

Do you consider yourself mainly a *landlord* (you lease your land to another producer) or a ***tenant/producer*** (you grow crops on land that you own and/or lease)**?**

☐ **I am mainly a landlord** ⟹ Please complete the enclosed purple "Landowner Survey." Using the postage-paid envelope provided, please send this survey to the producer who leases the largest amount of land from you.

☐ **I am mainly a tenant** ⟹ **Please answer the following question and then continue to Section A on the next page.**

Q1 **How many total acres do you operate, including land that you own and lease?**

_____ # of acres of grain crops _____ # of acres of hay or pasture

Please help us complete this project by taking two actions:

Step 1: **After completing this questionnaire, please use the pre-addressed and stamped envelope to return the questionnaire to us at:**
331 Waters Hall Manhattan, KS 66506.

Step 2: **If you lease farmland from someone else, please seal, address, and mail the enclosed purple, postage-paid questionnaire to the landowner of your largest lease (in acres).**

SECTION A: FARMLAND YOU OWN

A1 **Do you produce crops on land that you <u>own</u>?**

(Please check 'NO' if only your tenants (another producers) grow crops on your land.)

☐ **NO** ⟹ If '**NO'**, please **skip to Section B.**

☐ **YES** ⟹ If '**YES'**, please **continue filling out the questionnaire.**

A2 **How many acres of cropland and pastureland do you own and manage yourself (do not include land that you lease from someone else)?**

_____ # of acres of grain crops _____ # of acres of hay or pasture

A3 **In which <u>county</u> and <u>state</u> is the majority of the <u>cropland</u> that you own and manage located?**

_____ (County) _____ (State)

A4 **List the top 3 crops that you <u>grew in 2017</u> on <u>acres that you own?</u>**

<u>(Do not include crops that you grow on land that you lease.)</u>

<u>Crop Name</u> **Please write double cropped acreage on one line, Example: wheat / soybeans**	**# Total acres**	**# of acres irrigated**	**Yield (bushels/acre)**
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
Fallow land (land not in production)	_____	_____	**n/a**

A5 **What is a typical <u>5-year crop rotation</u> on the <u>largest field that you own and manage</u>?**

_____

A6 **What proportion of the cropland you <u>own</u> is tile drained?** _____ percent (%)

A7	**Is any land that <u>you own</u> currently enrolled in the following programs?**	**No**	**Yes**	**If yes, how many acres?**
	Conservation Stewardship Program (CSP)	☐	☐	_____
	Environmental Quality Incentives Program (EQIP)	☐	☐	_____
	Conservation Reserve Program (CRP)	☐	☐	_____
	Other conservation/environmental program (*please specify*) _____	☐	☐	_____
	Other conservation/environmental program (*please specify*) _____	☐	☐	_____

A8	**Do you currently use any of the following management practices <u>on cropland that you own (not leased land)?</u>**	**No**	**Yes**	**If yes, on how many acres?**
	Cover crops during the winter (ex: rye, radish, clover, etc.)	☐	☐	_____
	Filter strips, riparian buffers, or grassed waterways	☐	☐	_____
	Conservation tillage or no-till	☐	☐	_____
	Control structures for subsurface drain water	☐	☐	_____
	Nutrient management plan	☐	☐	_____
	Pollinator or wildlife habitat restoration	☐	☐	_____
	Other practices: (*please specify*)_____	☐	☐	_____

SECTION B-1: FARMLAND YOU LEASE

B1 **Do you produce crops on land that you lease from someone else?**

☐ **NO** ⟹ If '**NO'**, please **skip the next section and move to Section C**

☐ **YES** ⟹ If '**YES'**, please **continue with Section B-1 and B-2**

B2 **How many acres of farmland did you lease from someone else in 2017?**

_____ # of acres of grain crops _____ # of acres of hay or pasture

B3 **How many landlords did you have across all of the land that you leased?** _____

B4 **How many of those landlords live in the following locations**
(please enter the number of your landlords living at these locations):

_____ live on their own farmland

_____ live off the farm, but in the same county as their farmland

_____ live in the same state, but in a different county than their farmland

_____ live outside of the state in which they own their farmland

SECTION B-2: YOUR LARGEST LEASE

Please answer the following questions about cropland in your largest lease (in acres).
→ In this section, we want to know about your lease with the most acreage.

B5 **How many acres of cropland is in your largest lease?** _____ **acres**

B6 **In which county and state is your largest lease located?**_____(Co.) _____(State)

B7 **How far away from your house is the land in your largest lease?** ____ **miles**

B8 **Who do you lease this ground from?**

☐ Individual ☐Family ☐ Trust ☐ Other _____(please specify)

B9 **If leasing from an individual, what is your landowner's age and gender?**

_____ Approximate age ☐ Male ☐ Female ☐ Prefer not to answer

B10 **Is this landowner a retired farmer/rancher?** ☐ Yes ☐ No

B11 **Which best describes your relationship with this landowner?** (check all that apply)

☐ Family ☐ Friend ☐ Neighbor ☐ Acquaintance ☐ Business only

B12 **How did this landowner obtain this land?** ☐ Inherit ☐ Purchase ☐ Not sure

B13 **How long have you been leasing from this person/entity?** _____ years

B14 **How often do you meet or interact with the landowner of your largest lease to discuss issues related to the land that you lease from them?**

☐ Less than once per year ☐ 2-4 times per year

☐ Once per year ☐ 5+ times per year

B15 **Contract type for your largest lease:** ☐ Cropshare ☐ Fixed cash ☐ Flex lease

If you pay rent, please answer the 4 questions below.

a. What was the **cropland rent for 2017**? $ _____ per acre of cropland

b. **Number of installments** in which rent is paid: _____

b. **In which year** was this rental rate negotiated? _____

c. **In which year** will you negotiate the next rental rate for this lease? _____

B16 **List the top 3 crops that you grew in 2017 on land in your largest lease?**

Crop Name Please write double cropped acreage on one line, Example: wheat / soybeans	# Total Acres	# of acres irrigated	Yield (bushels/acre)	% share of crop yield going to landlord
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
_____	_____	_____	_____	_____
Fallow land (not in production)	_____	_____	**n/a**	**n/a**

B17 **What proportion of the cropland in your largest lease is tile drained? ____ (%)**

B18 **Are any of the following production costs shared between you and the landowner of the acreage in your largest lease?**

	No	Yes	If yes, what % of costs are paid by the landlord yearly?
Fertilizer	☐	☐	_____
Chemicals (herbicide, fungicide, insecticide, etc.)	☐	☐	_____
Other input (*please specify*) _____	☐	☐	_____
Other input (*please specify*) _____	☐	☐	_____

B19 **What is a typical <u>5-year crop rotation</u> on the <u>biggest field in your largest lease</u>?**

_____

B20 **Are you aware that there are federal and state conservation programs that can help support the use of environmentally-sustainable management practices on land that you lease? ☐ Yes ☐ No**

B21 **How does the landowner of your largest lease feel about conservation programs and environmentally sustainable management practices?**

- ☐ This landowner requires that I use certain conservation management practices.
- ☐ This landowner is in favor of conservation, but does not require specific practices.
- ☐ This landowner is indifferent regarding conservation management practices.
- ☐ This landowner is opposed to me using conservation management practices.
- ☐ I do not know my landowner's motivations regarding conservation management practices.
- ☐ Other (Please specify) _____

B22	Is the land in your largest lease enrolled in any of the following programs?	No	Yes	If yes, how many acres?
	Conservation Stewardship Program (CSP)	☐	☐	_____
	Environmental Quality Incentives Program (EQIP)	☐	☐	_____
	Conservation Reserve Program (CRP)	☐	☐	_____
	Other conservation/environmental program (*please specify*) _____	☐	☐	_____
	Other conservation/environmental program (*please specify*) _____	☐	☐	_____

B23	Do you use any of the following management practices on the land in your largest lease?	No	Yes	If yes, how many treated acres?
	Cover crops during the winter (ex: rye, radish, clover, etc.)	☐	☐	_____
	Filter strips, riparian buffers, or grassed waterways	☐	☐	_____
	Conservation tillage or no-till	☐	☐	_____
	Control structures for subsurface drain water	☐	☐	_____
	Nutrient management plan	☐	☐	_____
	Wildlife / pollinator habitat restoration	☐	☐	_____
	Other practices: (*please specify*)_____	☐	☐	_____
	Other practices: (*please specify*)_____	☐	☐	_____

SECTION C: LEASE SCENARIOS

We would like to understand your preferences for lease scenarios in which the land that you manage is enrolled in the Conservation Stewardship Program (CSP).

What is the Conservation Stewardship Program (CSP)?

The CSP is a voluntary program for working agricultural lands to enhance current stewardship efforts. This program is administered by the U.S. Department of Agriculture's Natural Resource Conservation Service (USDA NRCS). The CSP helps farmers strengthen their own operations while providing benefits to local communities, like improving water quality and wildlife habitat.

CSP participants work with local NRCS conservation planners to decide which conservation management practices ("enhancements") are the best fit for their operation. They are required to maintain the initial level of stewardship and adopt at least one new practice to address a resource concern.

Participants receive an annual per acre base payment for enrolling the land. Additional funding is available to support the adoption of new conservation practices ("enhancements").

→When you answer the questions in this section of the questionnaire, please consider only the base payment that you would get for enrolling in the CSP. Keep in mind that, in reality, additional payments would be available to support the adoption of new practices.

INSTRUCTIONS FOR THIS SECTION:

- **Consider the current rental agreement for your largest lease (the lease that you described in Section B-2).**
- **On each page of this section, we will describe two alternative lease scenarios.**
  - **These scenarios are labeled "Scenario A" and "Scenario B."**
  - **Under these scenarios, the land you lease would be enrolled in the Conservation Stewardship Program (CSP).**
  - **A 'Do Not Enroll' option is also provided.**
- **Your task: On each page, please select your most preferred and your least preferred lease scenario.**
- Note: In this section of the questionnaire, the lease scenarios shown on one page are not related to the scenarios shown on another page. Please only compare scenarios that are shown on the same page.

SECTION C: LEASE SCENARIOS – PART 1/4

Step 1: Review the alternative lease scenarios described below.

Attribute of the lease	Scenario A	Scenario B	Scenario C
Minimum portion of the total operation acreage *(land you own and lease)* **that must be enrolled in the CSP.**	50%	100%	Do not enroll
Division of the CSP base payment (average payment per acre)	$4.00/acre to producer $4.00/acre to landowner	$20.00/acre to producer $0.00/acre to landowner	
CSP Application Time (includes time talking with your landlord(s) and filling out forms)	4 hours	4 hours	

*Note: The lease scenarios discuss only base payments, which represent the average payment per acre. Through the CSP, additional payments are available to support the adoption of new practices.

Step 2: Choose your most preferred and your least preferred lease scenarios.

	Scenario A	Scenario B	Scenario C
Pick the lease scenario that you prefer the MOST *(check one box on this row)*	☐	☐	☐
Pick the lease scenario that you prefer the LEAST *(check one box on this row)*	☐	☐	☐

What factor(s) influenced your choices of your MOST and LEAST preferred leases?

SECTION C: LEASE SCENARIOS – PART 2/4

Step 1: Review the alternative lease scenarios described below.

Attribute of the lease	Scenario A	Scenario B	Scenario C
Minimum portion of the total operation acreage *(land you own and lease)* **that must be enrolled in the CSP.**	75%	25%	Do not enroll
Division of the CSP base payment (average payment per acre)	$10.50/acre to producer $3.50/acre to landowner	$26.00/acre to producer $0.00/acre to landowner	
CSP Application Time (includes time talking with your landlord(s) and filling out forms)	16 hours	2 hours	

*Note: The lease scenarios discuss only base payments, which represent the average payment per acre. Through the CSP, additional payments are available to support the adoption of new practices.

Step 2: Choose your most preferred and your least preferred lease scenarios.

	Scenario A	Scenario B	Scenario C
Pick the lease scenario that you prefer the MOST *(check one box on this row)*	☐	☐	☐
Pick the lease scenario that you prefer the LEAST *(check one box on this row)*	☐	☐	☐

What factor(s) influenced your choices of your MOST and LEAST preferred leases?

SECTION C: LEASE SCENARIOS – PART 3/4

Step 1: Review the alternative lease scenarios described below.

Attribute of the lease	Scenario A	Scenario B	Scenario C
Minimum portion of the total operation acreage *(land you own and lease)* **that must be enrolled in the CSP.**	75%	25%	Do not enroll
Division of the CSP base payment (average payment per acre)	$14.00/acre to producer $0.00/acre to landowner	$2.00/acre to producer $6.00/acre to landowner	
CSP Application Time (includes time talking with your landlord(s) and filling out forms)	8 hours	2 hours	

*Note: The lease scenarios discuss only base payments, which represent the average payment per acre. Through the CSP, additional payments are available to support the adoption of new practices.

Step 2: Choose your most preferred and your least preferred lease scenarios.

	Scenario A	Scenario B	Scenario C
Pick the lease scenario that you prefer the MOST *(check one box on this row)*	☐	☐	☐
Pick the lease scenario that you prefer the LEAST *(check one box on this row)*	☐	☐	☐

What factor(s) influenced your choices of your MOST and LEAST preferred leases?

SECTION C: LEASE SCENARIOS – PART 4/4

Step 1: Review the alternative lease scenarios described below.

Attribute of the lease	Scenario A	Scenario B	Scenario C
Minimum portion of the total operation acreage *(land you own and lease)* **that must be enrolled in the CSP.**	100%	25%	Do not enroll
Division of the CSP base payment (average payment per acre)	$20.00/acre to producer $0.00/acre to landowner	$19.50/acre to producer $6.50/acre to landowner	
CSP Application Time (includes time talking with your landlords(s) and filling out forms)	4 hours	16 hours	

*Note: The lease scenarios discuss only base payments, which represent the average payment per acre. Through the CSP, additional payments are available to support the adoption of new practices.

Step 2: Choose your most preferred and your least preferred lease scenarios.

	Scenario A	Scenario B	Scenario C
Pick the lease scenario that you prefer the MOST *(check one box on this row)*	☐	☐	☐
Pick the lease scenario that you prefer the LEAST *(check one box on this row)*	☐	☐	☐

What factor(s) influenced your choices of your MOST and LEAST preferred leases?

SECTION D: QUESTIONS ABOUT YOU

D1 **How many years have you been farming?** _____(Years)

D2 **Are/were your parents or grandparents farmers?**

☐ No ☐ Yes, parents ☐ Yes, grandparents ☐ Yes, parents and grandparents

D3 **What is the highest level of education you have completed?**

☐ Less than 12 years
☐ High school or GED
☐ Associate's degree and/or technical training
☐ Bachelor's degree
☐ Graduate degree

D4 **How strongly do you agree with the following statements?**

	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
By their choice of management practices, crop farmers can affect the environment.	☐	☐	☐	☐	☐
Farmers have a responsibility to manage cropland in a way that protects their local environment.	☐	☐	☐	☐	☐
I feel good about using management practices that improve the environment.	☐	☐	☐	☐	☐
Environmental stewardship only makes sense on my farm if it also contributes to income.	☐	☐	☐	☐	☐
Environmental stewardship makes sense on my farm because my neighbors and other family and community members do so.	☐	☐	☐	☐	☐
Being an environmental steward is an important part of my identity.	☐	☐	☐	☐	☐
The landowner of my largest lease thinks that I should participate in conservation programs.	☐	☐	☐	☐	☐
I work closely with conservation agencies/groups.	☐	☐	☐	☐	☐

D5 **Please rank the factors that influence your decisions about how you manage your owned and leased farmland *(1 = most important and 4 = least important)***

Owned	Leased	
_____	_____	Financial returns from the property
_____	_____	Environmental stewardship
_____	_____	Other; please specify _____
_____	_____	Other; please specify _____

D6 **Rate your willingness to take financial risks with respect to your farm operation on a 10-point scale, with 1=completely unwilling & 10=completely willing.** (Circle one)

Completely unwilling to take risks	(1)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	**Completely willing to take risks**

D7 **What is your age and gender?** _____(Years) ☐ Female ☐ Male ☐ Prefer not to answer

D8 **What was your household's annual gross income in 2016?** (mark one box)
Include pretax income from all sources (salary, wages, social security, rental properties, and investment income). This number can be found on IRS Form 1040.

- ☐ Less than $25,000
- ☐ $25,000 to $49,999
- ☐ $50,000 to $79,999
- ☐ $80,000 to $99,999
- ☐ $100,000 to $149,999
- ☐ $150,000 and above

D9 **What proportion of your household's annual gross income was earned through farming?** (mark one box)

☐ Less than 25% ☐ 25%-50% ☐ 50%-75% ☐ 75%-100%

D10 **What is the primary source of income for your household? _____**

D11 **What is the <u>5-digit zip code</u> of your current residence? _____**

Thank you for participating in this project!

Please help us complete this project by taking two actions:

Step 1: **After completing the questionnaire, please use the pre-addressed and stamped envelope to return it to us at 331 Waters Hall Manhattan, KS 66506.**

Step 2: **If you lease farmland, please seal, address, and mail the enclosed postage-paid questionnaire to the landowner of your largest lease (in acres).**

If you have questions about this research or this questionnaire, please contact Dr. Mykel A. Taylor at (785) 532-3033 or by email at *mtaylor@ksu.edu*

KANSAS STATE UNIVERSITY

Landowner Questionnaire

A SURVEY OF YOUR OPINIONS

*The **goal** of this research is to understand tenants' and landowners' opinions about agricultural management and their interest in participating in Farm Bill programs. Results will help to identify ways to improve programs for long-term agricultural profitability and environmental sustainability.*

Your opinions matter! Please help us learn from you by completing this questionnaire.

Remember, all individual responses are anonymous and confidential.

Thank you for taking our survey. You are helping to inform the design of future Farm Bill Programs that better reflect the views and concerns of producers and landowners in Kansas.

WHO SHOULD FILL OUT THIS SURVEY?

Are grain crops *(ex: corn, soybeans, wheat)* **grown on land that you own?**

☐ **NO** ⟹ **If "NO,"** we do not need you to complete this survey, but it is very important for us to know that you received this questionnaire. Please return this questionnaire to us using the postage-paid envelope provided. Thank you!

☐ **YES** ⟹ **If "YES," please continue filling out the questionnaire.**

SECTION A: FARMLAND YOU OWN

A1 **How many acres of cropland and pastureland do you own?**

_____ # of acres of grain crops _____ # of acres of hay or pasture

A2 **In which county and state is the majority of the cropland that you own located?**

_____ (county) _____ (state)

A3 **Do you (or someone living in your household) grow crops on land that you own?** *(Please check 'No' if someone else grows crops on your land)*

☐ **NO** ⟹ If '**NO'**, please **skip to Section B for questions about leased land.**

☐ **YES** ⟹ If '**YES'**, please **continue with the questionnaire**

A4 **List the top 3 crops grown in 2017 on acres you own and manage (not leased land)**

Crop Name **Please write double cropped acreage on one line, Example: wheat / soybeans**	**# Total acres**	**# of acres irrigated**	**Yield (bushels/acre)**
_____	_____	_____	_____
_____	_____	_____	_____
_____	_____	_____	_____
Fallow land (uncultivated, "resting" land)	_____	_____	**n/a**

A5 **What is a typical 5-year crop rotation on the largest field that you own and manage?**

_____

A6 **What portion of the cropland that you own and manage is tile drained? _____(%)**

A7

Is any of the cropland that you own and manage (not leased land) currently enrolled in any of the following programs?	**No**	**Yes**	**If yes, how many acres?**
Conservation Stewardship Program (CSP)	☐	☐	_____
Environmental Quality Incentives Program (EQIP)	☐	☐	_____
Conservation Reserve Program (CRP)	☐	☐	_____
Other conservation/environmental program (*please specify*) _____	☐	☐	_____

A8

Do you currently use any of the following management practices on cropland that you own and manage (not leased land?)	**No**	**Yes**	**If yes, on how many acres?**
Cover crops during the winter (ex: rye, radish, clover, etc.)	☐	☐	_____
Filter strips, riparian buffers, or grassed waterways	☐	☐	_____
Conservation tillage or no-till	☐	☐	_____
Control structures for subsurface drain water	☐	☐	_____
Nutrient management plan	☐	☐	_____
Pollinator or wildlife habitat restoration	☐	☐	_____
Other practices: (*please specify*)_____	☐	☐	_____

Q **Do you lease land to a producer who grows crops on that land?**

☐ **No** ⟹ **If "No," please skip to Section D.**

☐ **Yes** ⟹ **If "Yes," please continue filling out the questionnaire.**

SECTION B: FARMLAND YOU LEASE OUT

B1 **How many acres of farmland did you lease out in 2017?**

_____ # of leased acres with grain crops _____ # of leased acres in pasture/hay

B2 **How many tenants (farmers) pay you to grow crops on your land?** _____

Please answer questions B3 – B14 about cropland that you lease out to the tenant who sent you this questionnaire.

B3 **In which county and state is this leased land located?** _____(Co.) _____(State)

B4 **Approximate distance between your residence and the land that you lease out to this tenant is:** _____ **miles** (please enter '0' if you live on or beside this land)

B5 **Have you ever lived on the same property as this cropland?** ☐ **Yes** ☐ **No**

B6 **How did you obtain this land?** ☐ **Inherit** ☐ **Purchase** ☐ **Other** _____

B7 **Which best describes your relationship with this tenant?** (check all that apply)

☐ **Family** ☐ **Friend** ☐ **Neighbor** ☐ **Acquaintance** ☐ **Business only**

B8 **How long have you been leasing to this person/entity?** _____ years

B9 **How often do you meet or interact with this tenant to discuss issues related to the land that you lease to them?**

☐ Less than once per year
☐ Once per year
☐ 2-4 times per year
☐ 5+ times per year

B10 **What type of lease contract do you use? ☐ Cropshare ☐ Fixed cash ☐ Flex lease**

If you are paid rent, please answer the 4 questions below.

a. What was the **cropland rent for 2017**: $_____ per acre of cropland

b. **Number of installments in which rent received**? _____

d. **In which year was this rental rate initially negotiated**? _____

e. **In which year will you negotiate the next rental rate for this lease?**_____

B11 **Please rank the factors that influenced how you selected this tenant**
(1 = most important and 5 = least important)

_____ Financial returns from the property (rental rate offered)

_____ Tenant's environmental stewardship

_____ Family considerations

_____ Tenant's experience and reputation as a reliable farmer

_____ Other (please specify) _____

B12 **Are you aware that there are federal and state conservation programs that would help support environmentally-sustainable management practices on land that you lease out to other farmers? ☐ Yes ☐ No**

B13 **Have you and your tenant discussed enrolling the land you lease out to them in conservation programs?**

☐ No, we have not had this type of discussion.

☐ Yes, we have discussed participating in a conservation program, but we decided not to participate.

☐ Yes, we have discussed participating in a conservation program, and we are in the process of enrolling or will enroll in a conservation program during its signup period.

☐ Yes, we have had this discussion, and we currently participate in at least one conservation program.

B14 **In your lease agreement, do you require your tenant to use any of the following conservation** **No** **Yes** **If yes, what % of the**

practices? *(Please check "Yes" or "No" for each practice)*			**cost of that practice do you pay?** **0% - 100%**
Cover crops during the winter (ex: rye, radish, clover, etc.)	☐	☐	_____
Filter strips, riparian buffers, or grassed waterways	☐	☐	_____
Conservation tillage or no-till	☐	☐	_____
Control structures for subsurface drain water	☐	☐	_____
Nutrient management plan	☐	☐	_____
Pollinator or wildlife habitat restoration	☐	☐	_____
Other practices: (*please specify*)_____	☐	☐	_____

B15	**Would you like your tenant to use any of the following conservation practices that they do not currently use?** *(Please check "Yes" or "No" for each practice)*	**No**	**Yes**	**If yes, what % of the cost of that practice would you be willing to pay?** **0% - 100%**
	Cover crops during the winter (ex: rye, radish, clover, etc.)	☐	☐	_____
	Filter strips, riparian buffers, or grassed waterways	☐	☐	_____
	Conservation tillage or no-till	☐	☐	_____
	Control structures for subsurface drain water	☐	☐	_____
	Nutrient management plan	☐	☐	_____
	Pollinator or wildlife habitat restoration	☐	☐	_____
	Other practices: (*please specify*)_____	☐	☐	_____

SECTION C: LEASE SCENARIOS

We would like to understand your preferences for lease scenarios in which your land would be enrolled in the Conservation Stewardship Program (CSP).

What is the Conservation Stewardship Program (CSP)?

The CSP is a voluntary program for working agricultural lands to enhance current stewardship efforts. This program is administered by the U.S. Department of Agriculture's Natural Resource Conservation Service (USDA NRCS). The CSP helps farmers strengthen their own operations while providing benefits to local communities, like improving water quality and wildlife habitat.

CSP participants work with local NRCS conservation planners to decide which conservation management practices ("enhancements") are the best fit for their operation. They are required to maintain the initial level of stewardship and adopt at least one new practice to address a resource concern.

Participants receive an annual per acre base payment for enrolling the land. Additional funding is available to support the adoption of new conservation practices ("enhancements").

→When you answer the questions in this section of the questionnaire, please consider only the base payment that you would get for enrolling in the CSP. Keep in mind that, in reality, additional payments would be available to support the adoption of new practices.

INSTRUCTIONS FOR THIS SECTION:

- **Consider the current agreement for the lease you described in Section B.**
- **On each page of this section, we will describe two alternative lease scenarios.**
  - **These scenarios are labeled "Scenario A" and "Scenario B."**
  - **Under these scenarios, the land you lease would be enrolled in the Conservation Stewardship Program (CSP).**
  - **A 'Do Not Enroll' option is also provided.**
- **Your task: On each page, please select your most preferred and your least preferred lease scenario.**
- Note: In this section of the questionnaire, the lease scenarios shown on one page are not related to the scenarios shown on another page. Please only compare scenarios that are shown on the same page.

SECTION C: LEASE SCENARIOS – PART 1/4

Step 1: Review the alternative lease scenarios described below.

Attribute of the lease	Scenario A	Scenario B	Scenario C
Minimum portion of the total operation acreage *(land you own and lease)* **that must be enrolled in the CSP.**	50%	100%	Do not enroll
Division of the CSP base payment (average payment per acre)	$4.00/acre to landowner $4.00/acre to producer	$0.00/acre to landowner $20.00/acre to producer	
CSP Application Time (includes time talking with your tenant(s) and filling out forms)	4 hours	4 hours	

*Note: The lease scenarios discuss only base payments, which represent the average payment per acre. Through the CSP, additional payments are available to support the adoption of new practices.

Step 2: Choose your most preferred and your least preferred lease scenarios.

	Scenario A	Scenario B	Scenario C
Pick the lease scenario that you prefer the MOST *(check one box on this row)*	☐	☐	☐
Pick the lease scenario that you prefer the LEAST *(check one box on this row)*	☐	☐	☐

What factor(s) influenced your choices of your MOST and LEAST preferred leases?

_____

_____

_____

_____

_____

SECTION C: LEASE SCENARIOS – PART 2/4

Step 1: Review the alternative lease scenarios described below.

Attribute of the lease	Scenario A	Scenario B	Scenario C
Minimum portion of the total operation acreage *(land you own and lease)* **that must be enrolled in the CSP.**	75%	25%	Do not enroll
Division of the CSP base payment (average payment per acre)	$3.50/acre to landowner $10.50/acre to producer	$0.00/acre to landowner $26.00/acre to producer	
CSP Application Time (includes time talking with your tenant(s) and filling out forms)	16 hours	2 hours	

*Note: The lease scenarios discuss only base payments, which represent the average payment per acre. Through the CSP, additional payments are available to support the adoption of new practices.

Step 2: Choose your most preferred and your least preferred lease scenarios.

	Scenario A	Scenario B	Scenario C
Pick the lease scenario that you prefer the MOST *(check one box on this row)*	☐	☐	☐
Pick the lease scenario that you prefer the LEAST *(check one box on this row)*	☐	☐	☐

What factor(s) influenced your choices of your MOST and LEAST preferred leases?

SECTION C: LEASE SCENARIOS – PART 3/4

Step 1: Review the alternative lease scenarios described below.

Attribute of the lease	Scenario A	Scenario B	Scenario C
Minimum portion of the total operation acreage *(land you own and lease)* **that must be enrolled in the CSP.**	75%	25%	Do not enroll
Division of the CSP base payment (average payment per acre)	$0.00/acre to landowner $14.00/acre to producer	$6.00/acre to landowner $2.00/acre to producer	
CSP Application Time (includes time talking with your tenant(s) and filling out forms)	8 hours	2 hours	

*Note: The lease scenarios discuss only base payments, which represent the average payment per acre. Through the CSP, additional payments are available to support the adoption of new practices.

Step 2: Choose your most preferred and your least preferred lease scenarios.

	Scenario A	Scenario B	Scenario C
Pick the lease scenario that you prefer the MOST *(check one box on this row)*	☐	☐	☐
Pick the lease scenario that you prefer the LEAST *(check one box on this row)*	☐	☐	☐

What factor(s) influenced your choices of your MOST and LEAST preferred leases?

SECTION C: LEASE SCENARIOS – PART 4/4

Step 1: Review the alternative lease scenarios described below.

Attribute of the lease	Scenario A	Scenario B	Scenario C
Minimum portion of the total operation acreage *(land you own and lease)* **that must be enrolled in the CSP.**	100%	25%	Do not enroll
Division of the CSP base payment (average payment per acre)	$0.00/acre to landowner $20.00/acre to producer	$6.50/acre to landowner $19.50/acre to producer	
CSP Application Time (includes time talking with your tenant(s) and filling out forms)	4 hours	16 hours	

*Note: The lease scenarios discuss only base payments, which represent the average payment per acre. Through the CSP, additional payments are available to support the adoption of new practices.

Step 2: Choose your most preferred and your least preferred lease scenarios.

	Scenario A	Scenario B	Scenario C
Pick the lease scenario that you prefer the MOST *(check one box on this row)*	☐	☐	☐
Pick the lease scenario that you prefer the LEAST *(check one box on this row)*	☐	☐	☐

What factor(s) influenced your choices of your MOST and LEAST preferred leases?

SECTION D: QUESTIONS ABOUT YOU

D1 **Are you and/or your spouse an active or retired farmer?**

☐ No ☐ Active farmer ☐ Retired farmer

D2 **If yes, how many years of farming experience do you and/or your spouse have?**

# of years of farming experience for: _____ you _____ spouse (if applicable)

D3 **Are/were your parents or grandparents farmers?**

☐ No ☐ Yes, parents ☐ Yes, grandparents ☐ Yes, parents and grandparents

D4 **What is the highest level of education you have completed?**

☐ Less than 12 years
☐ High school or GED
☐ Associate's degree and/or technical training
☐ Bachelor's degree
☐ Graduate degree

D5

How strongly do you agree with the following statements?	Strongly disagree	Disagree	Neutral	Agree	Strongly Agree
By their choice of management practices, crop farmers can affect the environment.	☐	☐	☐	☐	☐
Farmers have a responsibility to manage cropland in a way that protects the environment.	☐	☐	☐	☐	☐
I feel good when management practices that improve the environment are used on my land.	☐	☐	☐	☐	☐
Environmental stewardship only makes sense on my farm if it also contributes to income.	☐	☐	☐	☐	☐
Environmental stewardship makes sense on my farm because my neighbors and other family and community members do so.	☐	☐	☐	☐	☐
Being an environmental steward is an important part of my identity.	☐	☐	☐	☐	☐
I consider my tenant (who sent this survey to me) to be an environmental steward.	☐	☐	☐	☐	☐
I work closely with conservation agencies/groups.	☐	☐	☐	☐	☐

D6 **Rate your willingness to take financial risks with respect to your farm on a 10-point scale, with 1-completely unwilling & 10-completely willing.** (Circle one)

Completely unwilling to take risks	(2)	(2)	(3)	(4)	(5)	(6)	(7)	(8)	(9)	(10)	**Completely willing to take risks**

D7 **What is your age and gender?** _____(Years) ☐ Female ☐ Male ☐ Do not wish to answer

D8 **What is your marital status?**

☐ Single ☐ Married ☐ Divorced/separated ☐ Widowed

D9 **What was your household's annual gross income in 2016?** (mark one box) Include pretax income from all sources (salary, wages, social security, rental properties, and investment income). This number can be found on IRS Form 1040.

☐ Less than $25,000
☐ $25,000 to $49,999
☐ $50,000 to $79,999
☐ $80,000 to $99,999
☐ $100,000 to $149,999
☐ $150,000 and above

D10 **What proportion of your household's annual gross income in 2016 was earned through farming?** (mark one box)

☐ Less than 25% ☐ 25%-50% ☐ 50%-75% ☐ 75%-100%

D11 **What is the primary source of income for your household? _____**

D12 **What is the <u>5-digit zip code</u> of your current residence? _____**

Thank you for participating in our survey!

Please help us complete this project by returning your completed questionnaire in the pre-addressed and stamped envelope to:
331 Waters Hall Manhattan, KS 66506.

If you have questions about this research or this questionnaire, please contact Dr. Mykel A. Taylor at
(785) 532-3033 or by email at *mtaylor@ksu.edu*